IS 4257-2 (1986): Dimensions for clamping arrangements for porcelain transformer bushings, Part 2: For 72.5 kV and 123 kV bushings [ETD 6: Electrical Insulators and Accessories]

BLANK PAGE

IS : 4257 (Part 2) - 1986
(Reaffirmed 2004)

Indian Standard

DIMENSIONS FOR CLAMPING ARRANGEMENTS FOR PORCELAIN TRANSFORMER BUSHINGS

PART 2 FOR 72·5 kV AND 123 kV BUSHINGS

UDC 621·315·626-229·312 : 006·78 : 621·314·21

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3

December 1986

Indian Standard

DIMENSIONS FOR CLAMPING ARRANGEMENTS FOR PORCELAIN TRANSFORMER BUSHINGS

PART 2 FOR 72·5 kV AND 123 kV BUSHINGS

Electrical Insulators and Accessories Sectional Committee, ETDC 3

Chairman	*Representing*
SHRI V. D. ANAND	Central Electricity Authority, New Delhi
Members	
DIRECTOR (TRANSMISSION) (*Alternate* I to Shri V. D. Anand)	
DIRECTOR (SUB-STATION) (*Alternate* II to Shri V. D. Anand)	
SHRI U. R. G. ACHARYA	Directorate General of Posts and Telegraphs, Jabalpur
SHRI P. P. AGRAWAL (*Alternate*)	
ADDITIONAL DIRECTOR (TI)	Research, Designs and Standards Organization (Ministry of Railways), Lucknow
DEPUTY DIRECTOR (OHE-II) (*Alternate*)	
SHRI R. S. ARORA	Directorate General of Supplies and Disposals, New Delhi
SHRI R. P. SEHGAL (*Alternate*)	
SHRI T. D. BANERJEE	Orissa State Electricity Board, Bhubaneshwar
SHRI GOURANGA PATRA (*Alternate*)	
SHRI R. T. CHARI	Tag Corporation, Madras
DR P. R. MADHAVAN (*Alternate*)	
SHRI G. L. DUA	Rural Electrification Corporation Ltd, New Delhi
SHRI S. C. KHURANA (*Alternate*)	
SHRI NAGIN SINGH GREWAL	Punjab State Electricity Board, Patiala
SHRI GIAN PRAKASH (*Alternate*)	
SHRI K. C. JAJU	Jaya Shree Insulators, Calcutta
SHRI A. K. NAGPAL (*Alternate*)	
SHRI I. K. KAPOOR	Directorate General of Technical Development, New Delhi
SHRI K. R. KASHYAP	High Tension Insulator Factory, Ranchi
SHRI A. K. AGRAWAL (*Alternate*)	

(*Continued on page* 2)

(*Continued from page* 1)

Members	*Representing*
SHRI B. KRISHNAMURTHY	Bharat Heavy Electricals Ltd, Bhopal
SHRI S. P. SINGH (*Alternate* I)	
SHRI J. R. NARLA (*Alternate* II)	
SHRI SYED KHADER MOHIUDDIN	Karnataka State Electricity Board, Bangalore
SHRI R. RANGASWAMY (*Alternate*)	
SHRI R. V. NADKARNI	Maharashtra State Electricity Board, Bombay
SHRI S. P. AMIDWAR (*Alternate*)	
SHRI P. L. NENE	Madhya Pradesh Electricity Board, Jabalpur
SHRI S. Z. HUSSAIN (*Alternate*)	
SHRI D. S. NELSON	Tamil Nadu Electricity Board, Madras
SHRI N. R. SANKARAN (*Alternate*)	
DR G. M. PHADKE	Indian Electrical Manufacturers' Association, Bombay
SHRI P. RAMACHANDRAN (*Alternate*)	
SHRI N. RAMAKRISHNAN	W. S. Insulators of India Ltd, Madras
SHRI R. G. VANCHEESWARAN (*Alternate*)	
SHRI V. B. RAM MOHAN	Central Power Research Institute, Bangalore
SHRI K. N. SRINIVASAN (*Alternate*)	
SHRI K. H. GURURAJA RAO	NGEF Limited, Bangalore
SHRI C. S. WARAD (*Alternate*)	
SHRI S. C. SEN	Bengal Potteries Ltd, Calcutta
SHRI D. K. MAZUMDAR (*Alternate*)	
SHRI R. D. SHETH	Electro Metal Industries, Bombay
SHRI SURENDRA SINGH	Government Pottery Development Centre, Khurja
SHRI T. B. L. SRIVASTAVA (*Alternate*)	
SHRI V. B. SINGH	UP State Electricity Board, Lucknow
SHRI S. C. RASTOGI (*Alternate*)	
SHRI L. VENKATESUBBU	Seshasayee Industries Ltd, Vadalur
SHRI R. V. ACHUTHAN (*Alternate*)	
SHRI U. S. VERMA	National Test House, Calcutta
SHRI P. C. PRADHAN (*Alternate*)	
SHRI S. P. SACHDEV, Director (Elec tech)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI R. K. MONGA
Joint Director (Elec tech), ISI

Panel for Dimensions of Bushings, ETDC 3 : P3

Convener	
SHRI V. SRINIVASAN	W. S. Insulators of India Ltd, Madras
Members	
SHRI R. K. AGRAWAL	Bharat Heavy Electricals Ltd, Bhopal
SHRI M. P. SINGH (*Alternate* I)	
SHRI B. KRISHNAMURTHY (*Alternate* II)	
DIRECTOR (SUB-STATIONS)	Central Electricity Authority, New Delhi
DEPUTY DIRECTOR (*Alternate*)	
SHRI S. V. MANERIKAR	Crompton Greaves Ltd, Bombay
SHRI R. G. PRADHAN	Bharat Bijlee Ltd, Bombay
SHRI P. RAMACHANDRAN	Transformers & Electricals Kerala Ltd, Angamally South
SHRI KURIAKOSE ANTONY (*Alternate*)	
SHRI P. S. RAMAN	NGEF Ltd, Bangalore
DR U. S. SINGH	High Tension Insulator Factory, Ranchi
SHRI A. D. DUA (*Alternate*)	

Indian Standard

DIMENSIONS FOR CLAMPING ARRANGEMENTS FOR PORCELAIN TRANSFORMER BUSHINGS

PART 2 FOR 72·5 kV AND 123 kV BUSHINGS

0. FOREWORD

0.1 This Indian Standard (Part 2) was adopted by the Indian Standards Institution on 7 March 1986, after the draft finalized by the Electrical Insulators and Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard (Part 2) deals with the dimensions of clamping arrangements for 72·5 kV and 123 kV rating bushings to be used with transformers. The materials for the parts have also been specified. The dimensions of clamping arrangements for 12 kV to 36 kV rating bushings are covered in Part 1 of this standard.

0.3 The dimensions of porcelain parts and metal part fittings for transformer bushings for lightly polluted and heavily polluted atmospheres are covered in a series of standards under IS : 3347* and IS : 8603†, respectively.

0.4 In the preparation of this standard, assistance has been derived from DIN 42538 — 'Transformers, clamping arrangement for bushings', issued by Deutsches Normenausschuss.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

*Dimensions for porcelain transformer bushings.

†Dimensions for porcelain transformer bushings for use in heavily polluted atmospheres.

‡Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard (Part 2) covers the clamping arrangements for porcelain transformer bushings of 72·5 kV and 123 kV ratings.

2. MATERIAL

2.1 The material of various parts shall conform to the relevant Indian Standards as specified below:

Part	*Material*
Clamping member (*see* Fig. 1)	Zinc base alloy 2 according to IS : 713-1981* or Aluminium alloy 4600 M designation according to IS : 617-1975†
Clamping ring (*see* Fig. 2)	Bright round bar according to IS : 9550-1980‡
Nut (*see* Fig. 3)	Bright hexagonal bar, Type 3, Grade 3 A/F 17 of IS : 9550-1980‡
Gasket (*see* Fig. 4)	Oil resistant compressed asbestos fibre jointing to Grade B10 according to IS : 2712-1979§

3. TOLERANCE

3.1 Unless specified otherwise, allowable tolerance on dimensions of any machined part shall be in accordance with medium class of IS : 2102 (Part 1)-1980||.

3.2 Unless specified otherwise, allowable tolerance of dimensions of any forged or cast part shall be in accordance with the coarse class of IS : 2102 (Part 1)-1980||.

4. SURFACE FINISH

4.1 The surface finish for ferrous parts shall be hot-dip galvanized according to IS : 4759-1979¶ or zinc plated according to IS : 1573-1970** or cadmium plated with chromate passivation Cd 8 Cr according to IS : 1572-1968†† subject to agreement between the manufacturer and the purchaser.

---

*Specification for zinc base alloy ingots for die castings (*second revision*).

†Specification for bright bars.

‡Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

§Specification for compressed asbestos fibre jointing (*second revision*).

||Specification for allowable deviations for dimensions without specified tolerances (*first revision*).

¶Specification for hot dip zinc coatings on structural and other allied products (*first revision*).

**Specification for electroplated coatings of zinc or iron and steel (*first revision*).

††Specification for electroplated coatings of cadmium or iron and steel (*first revision*)

4.2 The surface finish for non-ferrous parts shall be electrotinning according to IS : 1359-1977* subject to agreement between the manufacturer and the purchaser.

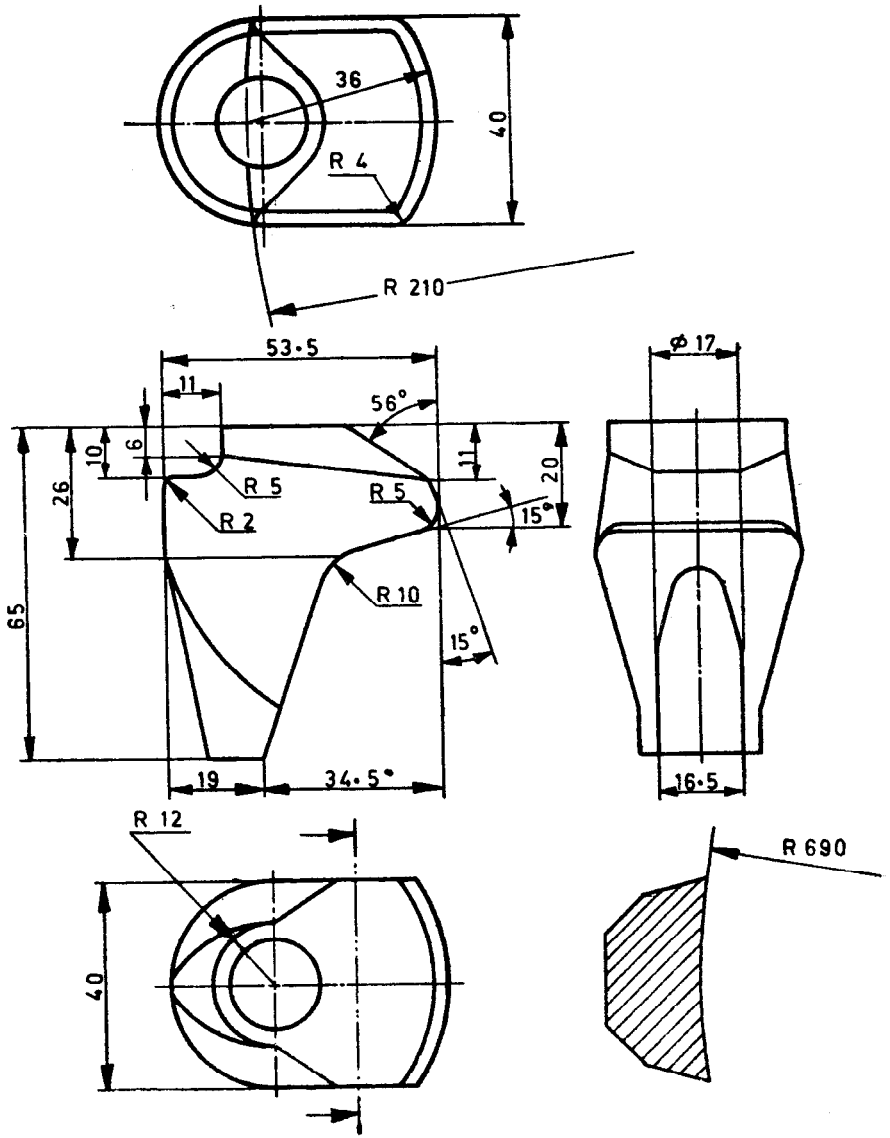
5. DIMENSIONS

5.1 The dimensions of components of clamping arrangements shall be in accordance with values given in Fig. 1 to 4.

6. METHOD OF CLAMPING

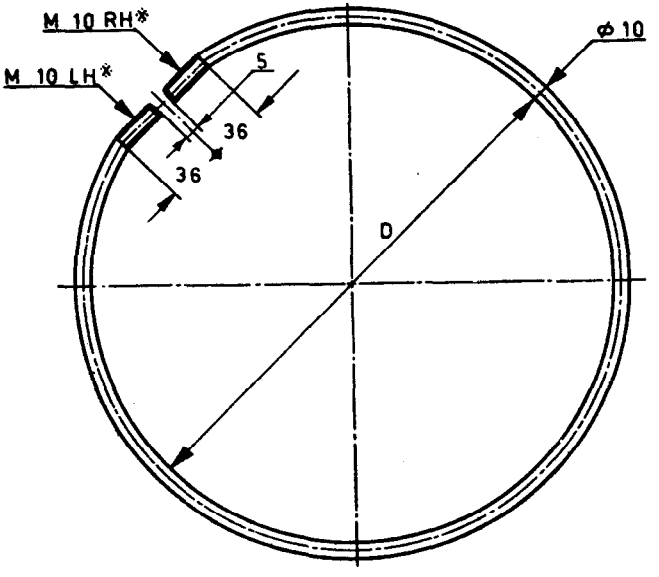
6.1 The method of clamping of bushings shall be as shown in Fig. 5 and 6.

*Specification for electroplated coatings of tin (*second revision*).



All dimensions in millimetres.

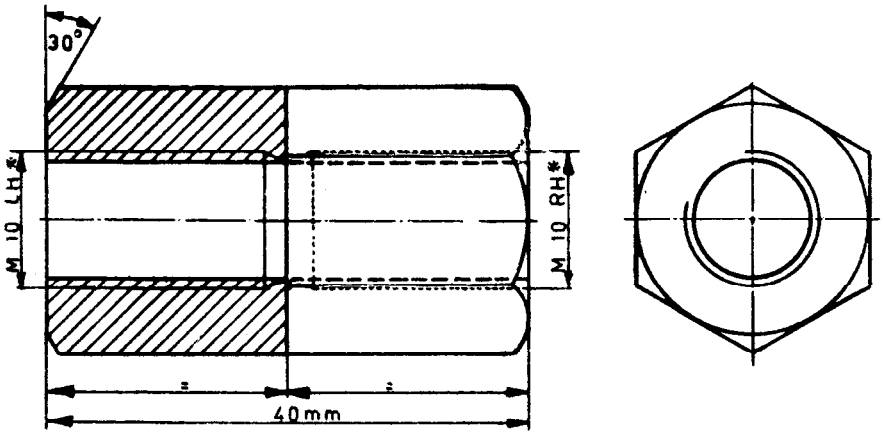
FIG. 1 CLAMPING MEMBER



BUSHING RATING	*D* mm
72·5 kV/1 250 A	326
123 kV/1 250 A	421

*Thread ends and runout shall be according to IS : 1368-1980 'Dimensions of ends of bolts and screws (*second revision*)' and IS : 1369-1982 'Dimensions of screw thread run-outs and undercuts (*second revision*)' respectively.

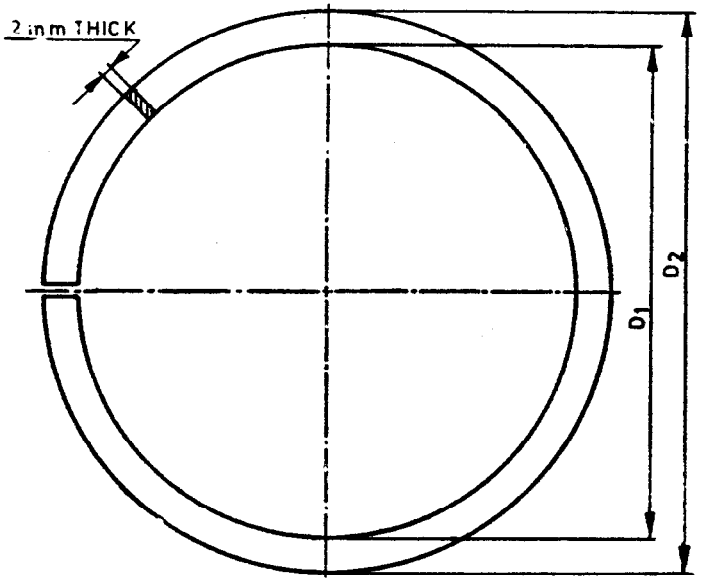
FIG. 2 CLAMPING RING



*Thread runout shall be according to IS : 1369-1982 'Dimensions of screw thread run-outs and undercuts (*second revision*)'

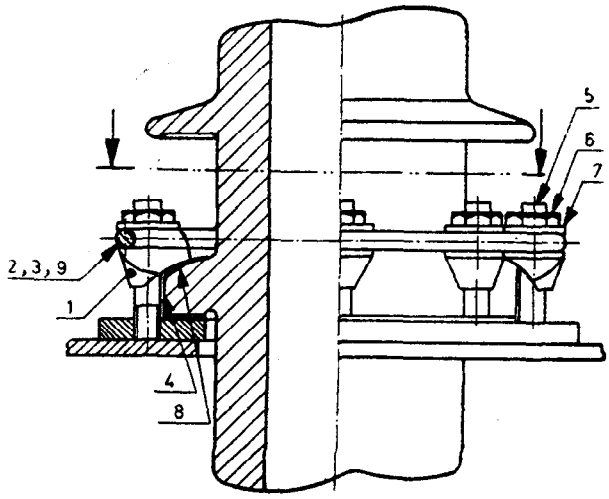
All dimensions in millimetres.

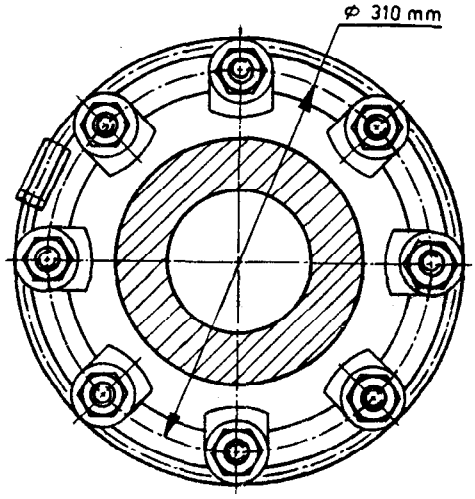
FIG. 3 NUT



BUSHING RATING	D_1 mm	D_2 mm
72·5 kV/1 250 A	242	320
123 kV/1 250 A	270	365

FIG. 4 GASKET





Item No.	*Particulars*	*No. of Units per Bushing*
1	Clamping Member (*see* Fig. 1)	8
2	Clamping Ring (*see* Fig. 2)	1
3	Nut (*see* Fig. 3)	1
4	Gasket (*see* Fig. 4)	1
5*	Stud M16 × 100, B-8.8, as perIS : 1862-1975†/ Weld Stud M16 × 120, St 42-w	8
6*	Hexagonal Nut M16, B-4, IS : 1364 (Part 2)-1983‡	8
7*	Punched Washer AM16, IS : 2016-1967§	8
8	Earthing Strip, Size : 0·5 × 40 × 50 Material : Electrolytic High-Conductivity Copper as per IS : 191 (Parts 1 to 10)-1980‖	1
9*	Hex, Nut M10 S-4, IS : 1364 (Part 2)-1983‡	1

*SURFACE FINISH : Galvanized as per IS : 4759-1984 'Specification for hot-dip zinc coatings on structural steel and other allied products (*second revision*)' or ELECTROPLATE coating of Cadmium with Chromate Passivation Cd 8 Cr as per IS : 1572-1968 'Specification for electroplated coatings of cadmium on iron and steel (*first revision*)'.

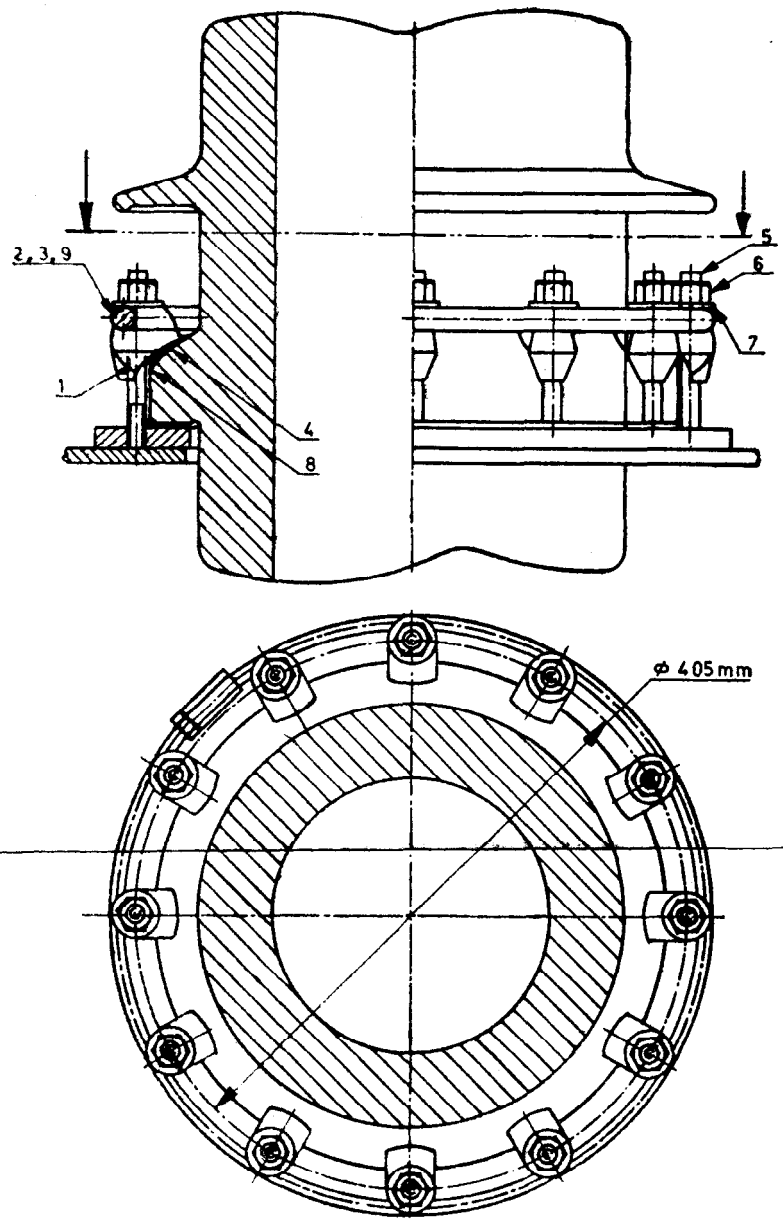
†Specification for studs (*second revision*).

‡Specification for hexagon head bolts, screws and nuts of product grade A and B: Part 2 Hexagon screws (size range M3 to M36) (*second revision*).

§Specification for plain washers (*first revision*).

‖Specification for copper (*third revision*).

FIG. 5 METHOD OF CLAMPING 72·5 kV/1 250 A BUSHING



Item No.	*Particulars*	*No. of Units per Bushing*
1	Clamping Member (*see* Fig. 1)	12
2	Clamping Ring (*see* Fig. 2)	1
3	Nut (*see* Fig. 3)	1
4	Gasket (*see* Fig. 4)	1
5*	Stud M16 × 100, B-8.8, as per IS : 1862-1975†/ Weld Stud M16 × 120, St 42-w	12
6*	Hexagonal Nut M16, B-4, IS : 1364 (Part 2)-1983‡	12
7*	Punched Washer AM16, IS : 2016-1967§	12
8	Earthing Strip, Size: 0·5 × 40 × 50 *Material* : Electrolytic High-Conductivity Copper as per IS : 191 (Parts 1 to 10)-1980‖	1
9*	Hex, Nut M10 S-4, IS : 1364 (Part 2)-1983‡	1

*SURFACE FINISH: Galvanized as per IS : 4759-1984 'Specification for hot-dip zinc coatings on structural steel and other allied products (*second revision*)' or ELECTROPLATE coating on Cadmium with Chromate Passivation Cd 8 Cr as per IS : 1572-1968 'Specification for electroplated coatings of cadmium on iron and steel (*first revision*)'.

†Specification for studs (*second revision*).

‡Specification for hexagon head bolts, screws and nuts of product grades A and B: Part 2 Hexagon screws (size range M3 to M36) (*second revision*).

§Specification for plain washers (*first revision*).

‖Specification for copper (*third revision*).

FIG. 6 METHOD OF CLAMPING 123 kV/1 250 A BUSHING